

## SCIENTIFIC NOTE

### THE LARVA OF *MELOE FRANCISCANUS* VAN DYKE AND MACSWAIN'S *MELOE* SP. A (COLEOPTERA: MELOIDAE)

In his important study of meloid first instar larvae, MacSwain (1956, Univ. Calif. Publ. Entomol., 12:1-182) described the highly distinctive larva of a species of *Meloe* which he referred to as *Meloe* sp. a. He noted that although the adults were unknown, the larvae of this species were the most commonly encountered *Meloe* on bees in California. He considered the possibility that the adults were subterranean and unknown. Considering the collecting locales of *Meloe* sp. a, Pinto and Selander (1970, Univ. Ill. Biol. Monogr., 42:1-222) believed this larva almost certainly belonged to *M. franciscanus* Van Dyke, *M. californicus* Van Dyke, or *M. vandykei* Pinto and Selander.

It now appears that MacSwain's *Meloe* sp. a is assignable to *Meloe franciscanus*. I collected several adults of this species feeding on *Astragalus lentiginosus* Douglas on 2 February 1973 on the sand dunes at the north end of Panamint Valley in Inyo County, California. The females oviposited and first instar larvae were obtained.

The first instar larva of *M. franciscanus* fits MacSwain's description of *Meloe* sp. a in most details. The four long subequal caudal setae, black coloration, large size (2.0-2.5 mm), longitudinally divided sterna on abdominal segments I-IV, lack of obvious sclerotization on the thoracic sterna, and short robust legs are characteristic of Panamint Valley *M. franciscanus* and *Meloe* sp. a. No other known North American *Meloe* has this combination of characteristics. The four elongate caudal setae (subequal to the abdomen in length) are unique. In other species only two of the caudal setae are elongate.

MacSwain's material differs from Panamint Valley specimens in two ways. He described the terminal seta of the antenna as being slightly shorter than the antenna itself. In the Panamint material the terminal seta is ca.  $\frac{1}{4}$  longer than the antenna. Also, MacSwain's specimens that I have examined (collected in Berkeley, California) have substantially larger spiracles. For example, the first abdominal spiracle is  $\frac{1}{2}$  as long as tergum I. In the Panamint material this spiracle is only  $\frac{2}{5}$  the length of tergum I.

Although the possibility that *Meloe* sp. a represents *M. californicus* or *M. vandykei* cannot be totally discounted, either association is unlikely. First of all, adults of *M. californicus* and *M. vandykei* are much less common in California than are those of *M. franciscanus*. More significantly, such an association would be inconsistent with the current classification of the subgenus *Meloe*. Minor anatomical differences notwithstanding, the unique fea-

tures of the larva of *M. franciscanus* from Panamint Valley and of *Meloe* sp. a are consistent with the unique traits of *M. franciscanus* adults. These adult characteristics led Pinto and Selander (1970) to place *M. franciscanus* in its own species group. *Meloe californicus* and *M. vandykei* were assigned to the Angusticollis Group along with the majority of North American *Meloe*. The first instar larvae of four species of the Angusticollis Group are known (Pinto and Selander, 1970). All are relatively similar to one another and, as a group, differ distinctly from *Meloe* sp. a and the confirmed larva of *M. franciscanus*.

*Meloe franciscanus* is known from several localities in central and southern California. It also occurs in northern Arizona, western Utah, and western Nevada (Pinto and Selander, 1970). In California it appears to be primarily cismontane, although it has now been taken on three dune systems (Eureka Valley, Kelso, and Panamint) in the high desert. So far, adults have been collected in numbers and during daylight hours only on sand dunes. Most of the other scattered records are based on single specimens. This is undoubtedly the reason MacSwain did not consider *M. franciscanus* as the identity of the larva of *Meloe* sp. a.

The reason for the small number of collections of adults of *M. franciscanus* is unknown. However, I suspect that it is due to nocturnal behavior of the adults of cismontane populations, as well as to the adults occurring primarily during winter when collectors are less likely to find them. Although data are lacking for *M. franciscanus* in areas other than desert dunes, the adults of two other cismontane California species, *Meloe strigulosus* Mannerheim and *M. occultus* Pinto and Selander, are active at night and in winter. I have observed numerous *M. strigulosus* adults near La Grange, California, in Stanislaus County in early January feeding on grass as late as midnight when air temperatures adjacent to the beetles were as low as 0°C. During the day they were inactive and found under logs and boards (Pinto, unpublished). Similarly, I have taken a few specimens of *M. occultus* at night in January in Menifee Valley in SW Riverside County. Mr. P. A. Sullivan (Eaton Canyon Nature Center, Pasadena, California; pers. comm.) has collected this species near Devil's Punchbowl County Park, on the north side of the San Gabriel Mountains in Los Angeles County at night in January and, in this case, with snow on the ground. Three other uncommon species of California *Meloe* (*M. californicus*, *M. vandykei*, and *M. barbarus*) may also be nocturnal.

John D. Pinto, *Department of Entomology, University of California, Riverside 92521.*